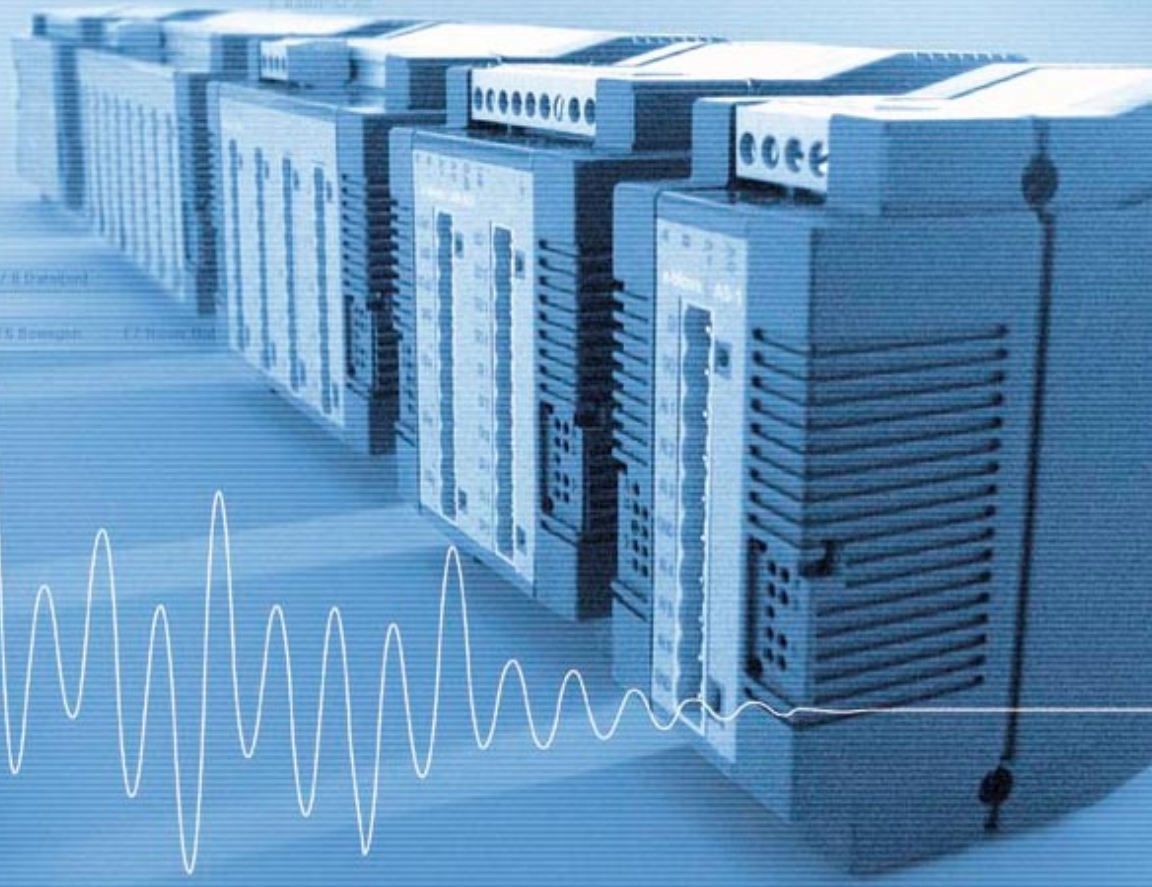
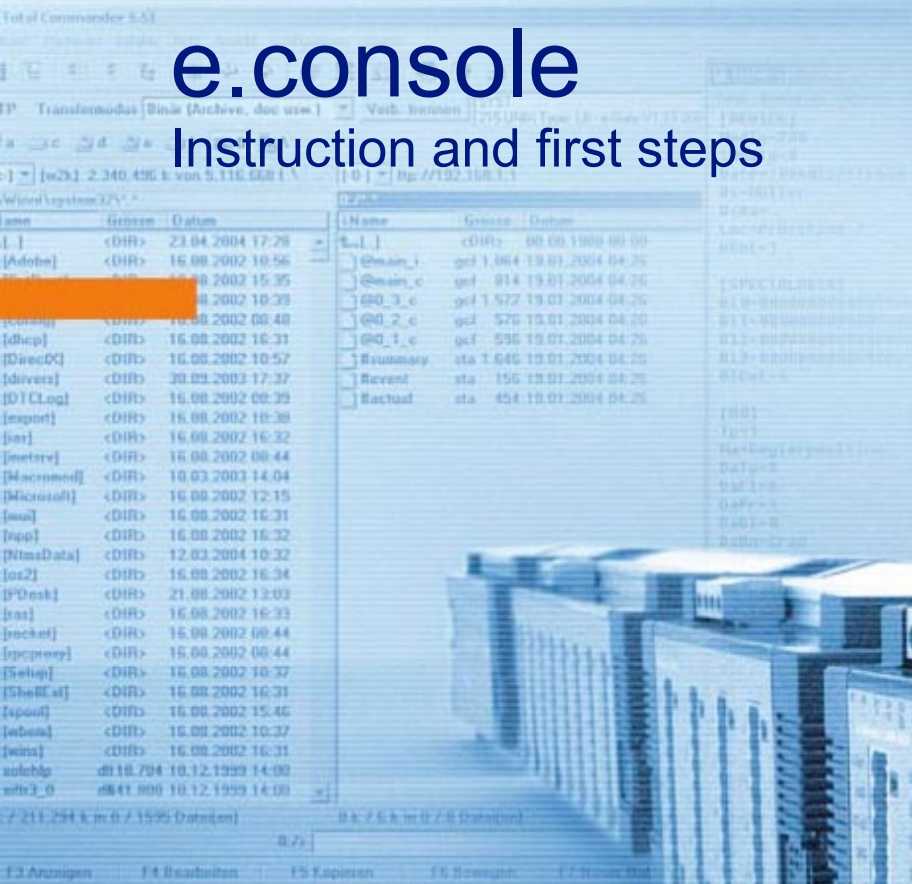


e.console

Instruction and first steps



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Important: Before commencing installation, commissioning, putting into service and before any maintenance work is carried out, it is essential that the relevant warning and safety instructions in this manual are read!

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1. INTRODUCTION

Visualizing and analyzing logged data is a key part of any data acquisition process.

e.console communicates with Intelligent Data Loggers and Sensor Modules (series ISM100 and e.bloxx) easily via an RS 232 interface, modem, GSM or TCP/IP.

e.console's main function is to archive logged data sets periodically and react on alarm messages sent by linked Intelligent Data Loggers and Sensor Modules. e.console displays data both, online and offline, and offers excellent analysis tools. Logged data can also be quickly and easily linked to external databases.

e.console is a software to

- visualize
- record
- document

data in a easy and fast way.

e.console is available in 2 versions:

Lite

Evaluation software e.console is a comfortable software for online data acquisition, visualization and archiving.

Standard

Beside the functions of the Lite version Data Loggers can be called up automatically at a pre-defined time to read data from its memory, measurement procedures can be defined and modem communication is being supported as well.

2. SYSTEM REQUIREMENTS

- PC with Pentium processor 100 MHz or higher.
- Windows 95, Windows 98, Windows 2000, Windows NT 4.0
- Free hard disc space: 50 MB
- RAM: 32 MB minimum
- Screen resolution: 800 x 600 pixels minimum
- Recommended color depth: 16 Bit

As the e.console online help is based on HTML, Internet Explorer 4.0 or higher is required when running Windows 95 or Windows NT 4.0 systems.

3. INSTALLATION

To install e.console, the e.console-CD has to be put into the CD-Drive. If the setup doesn't start automatically, the SETUP.EXE program has to be executed manually either with the windows explorer or with START / EXECUTE / x:\SETUP (where x is the drive letter of your CD-Drive).

The instructions on the screen have to be followed step by step. When being requested to enter the serial number, the 10-digit license number delivered with the software has to be used. It is possible to do the registration later on via "?" and "Registration...".

Hint:

At the end of the installation process, you will be requested to reboot your system, so Windows can update your system files. Therefore, it is recommended to close all running applications before starting the installation.

On systems with older versions of Windows 95, you will get the suggestion to install DCOM95 after the e.console setup has been started. DCOM95 is a Microsoft extension for windows operating systems, which is already included in Windows 98 and Windows NT. DCOM95 has to be installed to work with e.console on a Windows 95 system.

4. FIRST STEPS

The setup program creates a default symbol using the path START / PROGRAMS / e.console which can be used to execute e.console. If the software has been installed without a valid license number, e.console will start in a demo mode. In this mode e.console creates several virtual demo modules, which can be used to explore the capabilities of the software. It is not possible to start a real recording with real modules in demo mode.

Starting e.console the following window opens:




4.1. Manual Registration

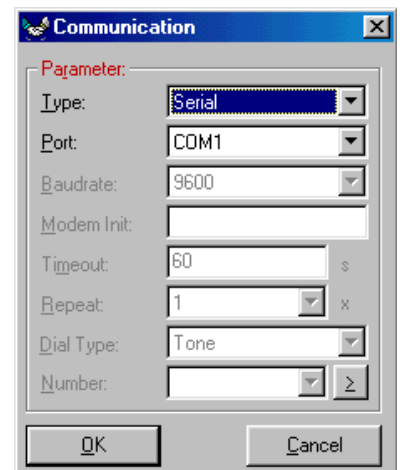
If you want to switch the e.console version from demo mode to real mode, the registration dialog has to be opened by clicking "Registration" in the "?" menu. Name, company and the license number corresponding to the license-code have to be entered and the OK button has to be clicked. After the verification of the license, e.console will do a network scan and inserts all the connected modules into the internal module table. Afterwards modules can be used to record data.



4.2. Network Scan

The network scan detects all modules, which are currently connected to the PC, and includes them in the module table. An automatic scan will be initiated when e.console is starting up. To execute a manual network scan, e.g. after connecting a new module to the PC, "Search" in the "Module" menu has to be selected. An additional possibility to do the scan is to click the symbol  in the menu bar.

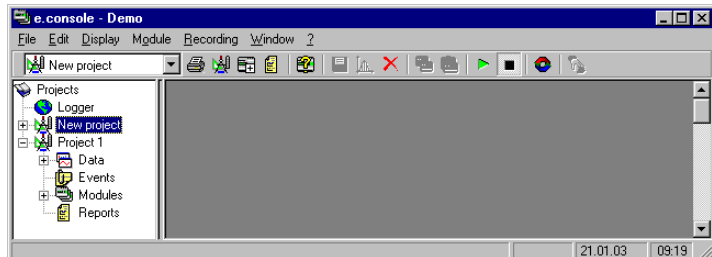
If the network scan does not find any connected modules, check the communication settings by selecting "Communication" in the menu "Module".



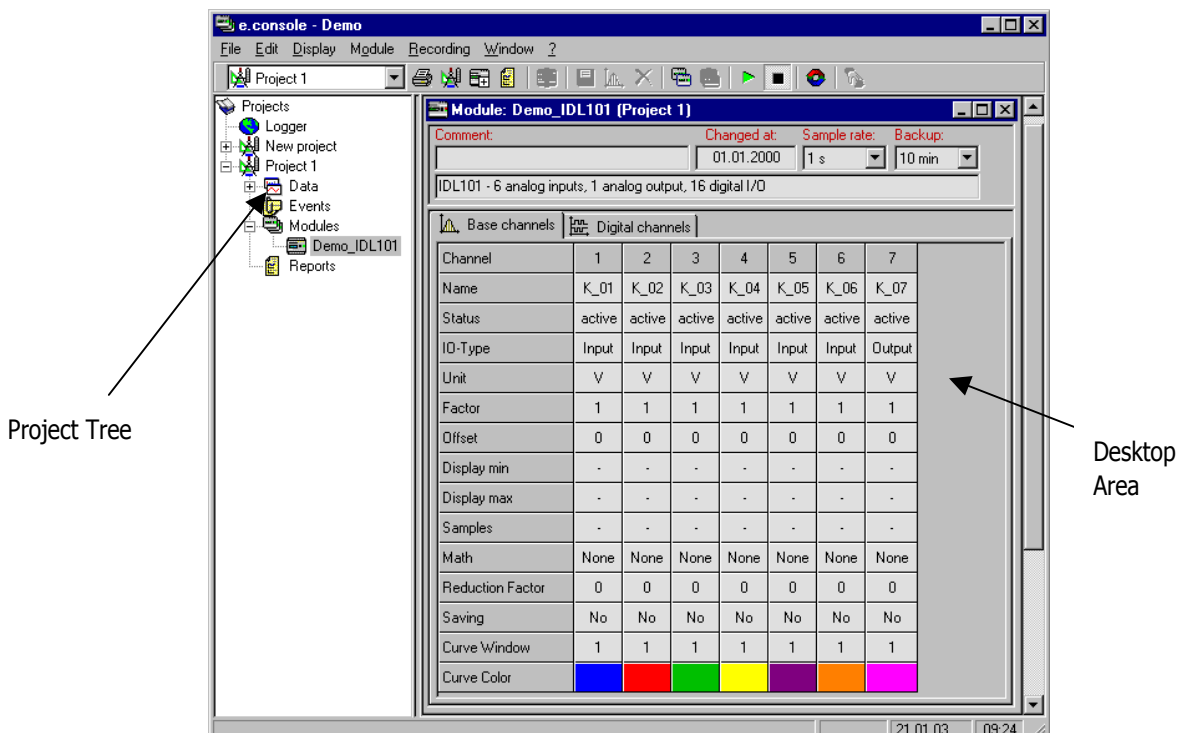
4.3. Parameter Setting

Each application is being defined as a project which consists of the following components:

- Data
- Events
- Modules



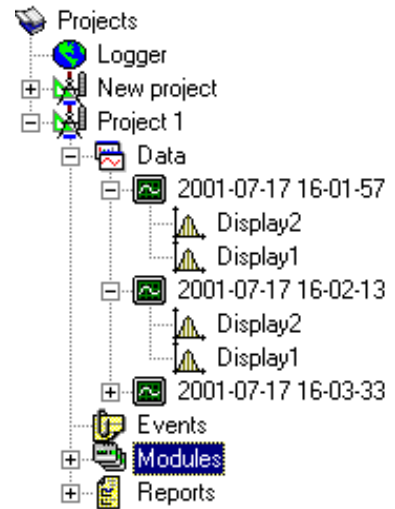
The main window of e.console has two different parts: The project tree and the desktop area.



4.3.1. Data

In this entry all data of the measurements of the project are being stored. The standard file name of the data set consists of date and time when the measurement starts. Nevertheless it can be changed afterwards. Therefore the file name has to be clicked with the right mouse button. Each measurement creates a new file.

As a standard 2 displays are being added, one for the analog channels, the other one for the digital channels. Up to 8 displays can be defined and combined to each other.



4.3.2. Events

The event protocol is being used to protocol any error, range errors, sensor breaks, etc. The conduct of the event protocol (append, over-write, etc.) can be controlled via the menu "File" and "Settings..." This way every detail of the measurement can be written

Time stamp	Number	Module	Channel	Event	Description
27.03.2001 13:03:44.020	300			Recording started	
27.03.2001 13:03:50.660	301			Recording stopped	
27.03.2001 13:03:56.320	300			Recording started	
27.03.2001 13:04:01.870	301			Recording stopped	
27.03.2001 13:12:15.320	300			Recording started	
27.03.2001 13:12:34.050	301			Recording stopped	
27.03.2001 13:14:07.530	300			Recording started	
27.03.2001 13:14:11.760	301			Recording stopped	
27.03.2001 13:14:17.140	300			Recording started	
27.03.2001 13:14:21.000	2	01-IDL...	5	Communication lost	The module doesn't answer anymore. Please check the connection.
27.03.2001 13:14:22.000	2	01-IDL...	5	Communication lost	The module doesn't answer anymore. Please check the connection.
27.03.2001 13:14:32.360	301			Recording stopped	

down completely and additionally there is no possibility to manipulate the protocol.

As soon as a protocol is being deleted during a measurement there will be the corresponding entry to the following protocol.


4.3.3. Modules

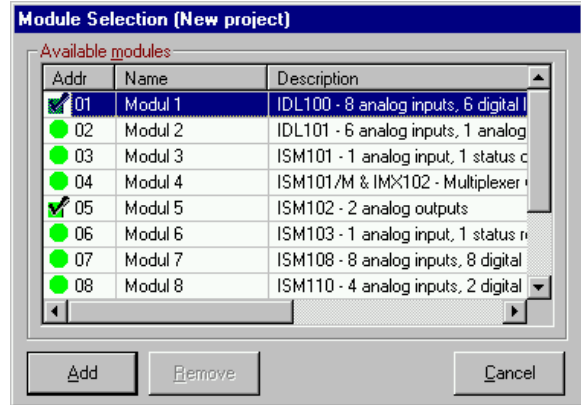
All the modules being used in the project are being displayed in here. As soon as a module is being marked in the project tree the already mentioned desktop area opens. Refer to the description in chapter 4.5. Additionally a calculation module can be defined. This feature is available with the standard version only.

4.3.4. Logger

A description can be found in chapter 6, Automation.

4.4. Adding a Module to a Project

To be able to record with a module it has to be added to the project first. This will be done either via the menu "Module" and "Add", by clicking the entry "Module" in the project tree with the right mouse button or via the symbol  in the toolbar. The mentioned calculation channels (refer to chapter 4.3.3) are being added as a calculation module. Only one calculation module can be added to one project but this could contain up to 100 calculation channels.

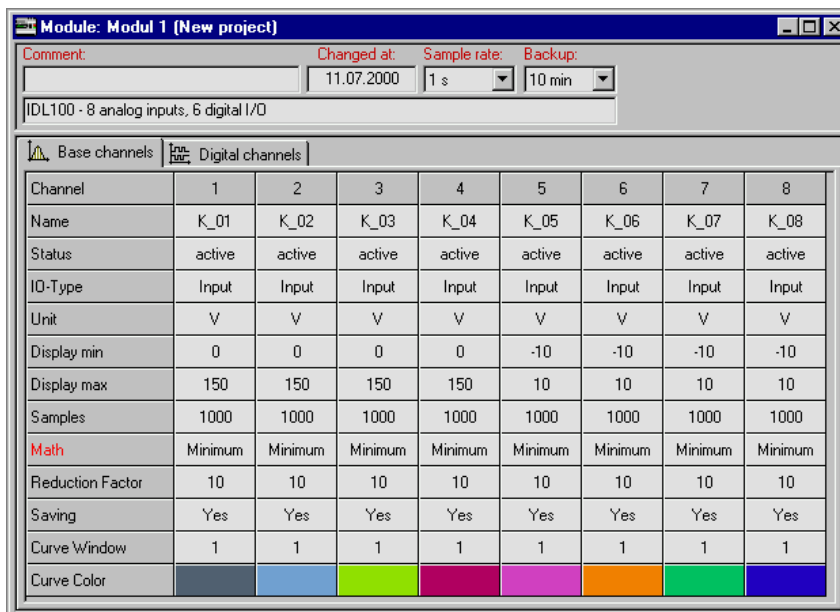


The dialog *Module Selection* shows all the modules available with a green dot. A red dot indicates a module not being available. Modules, which are already included in the project, have a checked dot. To add a module, it has to be selected from the list. Afterwards the "Add" button has to be clicked. To add multiple modules at once, the selection can be done by pressing the Ctrl key resp. the Shift key during selection.

4.5. Module configuration


In this case configuration means to do the settings for data acquisition. The configuration of the module itself cannot be changed.

In the following all these configuration possibilities are being described:



In the module's configuration the following data are being displayed, resp. can be changed:

- **Name:**
This is the name of the channel, which has been defined during configuration of the module. Clicking the right mouse button, the channel name can be edited and changed, no blanks may be included. This new name will be written to the module as well – the ICP100 configuration software will not be necessary for this procedure. The name has to be unique within a project.

 - **Status:**
This indicates whether measurement data should be transmitted to the PC or not. The following selections are possible by clicking the right mouse button:
 - active: the defined channel is being transmitted to the PC
 - passive: no data transmission will be performed
- 
- The screenshot shows a small window titled 'Status' with two radio button options: 'active' (which is selected) and 'passive'.
-
- **IO-Type:**
Here it is being described whether it is an input or output channel.

 - **Unit:**
The unit of the measurement value being defined in the module itself is displayed.

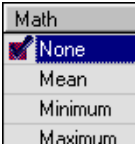
 - **Factor:**
A certain factor can be added to the channel. This factor is in accordance with the formula $y=kx+d$, where k is the factor and d the offset.

 - **Offset:**
As well as a factor an offset can be defined.

 - **Display min.:**
It refers to the scaling of the display for the corresponding channel

 - **Display max.:**
It refers to the scaling of the display for the corresponding channel

 - **Samples:**
The number of samples to be recorded are being defined. This can be different with each channel. The recording for each channel will stop as soon as the defined number of samples is reached. The measurement stops as soon as the number of samples of all the channels is reached. The standard setting is "-" which indicates that the recording will run until it is stopped manually.

 - **Math:**
With this function some calculations can be performed. At the moment there are the following possibilities:
 - Mean (at the moment only arithmetic mean)
 - Minimum
 - Maximum
- 
- The screenshot shows a small window titled 'Math' with four radio button options: 'None' (which is selected), 'Mean', 'Minimum', and 'Maximum'.

- Reduction factor:**
The value defined in here indicates how many measurement values have to be taken into account for the math-function described before. The value refers to the logging rate and not to the sample rate.
- Saving:**
When selecting "Yes" the displayed data are being stored. With "No" data are only being displayed. But at the end of the measurement there is the possibility to store data anyway. The selection can be realized with the right mouse button.
- Curve Window:**
Here it is being defined in which one of the 8 possible windows the curve should be displayed. Is there no entry, there will be no graphical display.
- Curve Colour:**
The colour of the graphical display can be defined according to the users idea.



Beside these possibilities for each single channel there are some global settings possible as well:

- Comment:**
An individual comment can be added.
- Changed at:**
This shows the date of the last changes in this configuration.
- Sample rate:**
The sample rate for the activated channels is being defined. A sample rate between 20ms an 1h can be selected. A powerful PC has to be available for an sample rate at about 20ms! In a project the lowest sample rate selected will be used.
- Backup:**
In this defined time interval data are being written onto the hard disk. Only activated channels are being stored.

Common Remarks:

To change a value in the sheet, the right mouse button has to be clicked on, followed by pressing the space bar or doing a double click on the desired field. Multiple fields in a row can be selected by holding the left mouse button. To copy the settings from one channel to another, the header of the source channel has to be clicked with the right mouse button and *Copy Channel* has to be selected. Then the header of the destination channel has to be selected, afterwards clicking the right mouse button and choosing *Paste Channel*.


4.6. Save the Configuration

With the button  a defined configuration can be stored and this way it is available for additional projects.

4.7. Copy the Configuration

Another possibility is to copy a configuration with the  - button.


4.8. Print the Configuration


For documentation purposes the whole configuration can be printed by clicking the  button. The programmed lines in the calculation channels will be printed as well.

5. MEASUREMENT

After the project has been defined according to the application the measurement can be started.

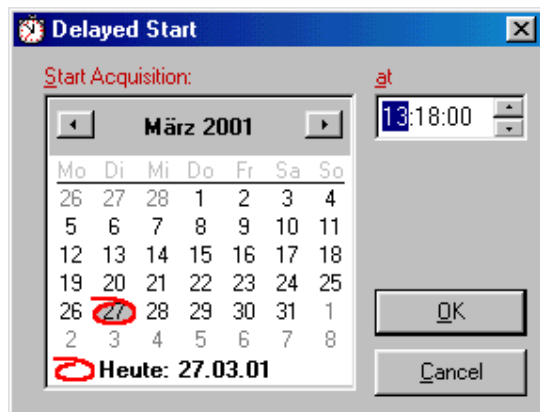
5.1. Starting and Stopping a Recording

After all the modules have been selected for the project the recording is being started by clicking "Start" in the menu "Recording" or by a click on the symbol  in the toolbar.

A recording stops, when the preset number of samples is reached or if "Stop" in the menu "Recording" is selected, resp. the symbol  is clicked in the toolbar. ■

5.2. Delayed Start

Instead of starting a recording immediately a certain start time can be defined by choosing "Delayed Start" in the menu "Recording".



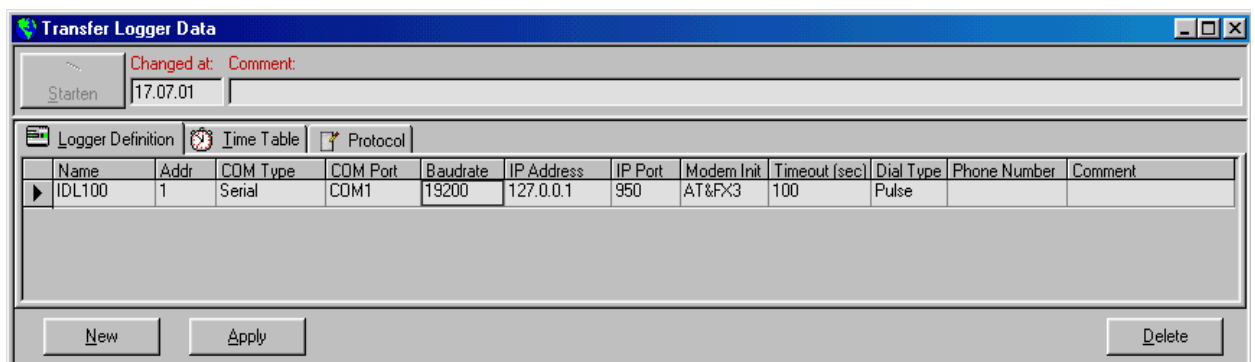
6. AUTOMATION

Data from data loggers can be transmitted to a PC automated at a predefined time. This can be realized via the serial interface as well as via a line or GSM modem. Please keep in mind, that the standard version of e.console is necessary for this functionality.

Via the menu "Recording" and "Automation" the necessary settings can be done.

6.1. Logger-Definition

To define the automation in a first step the settings for loggers have to be done. To set up a new logger the button "New" has to be clicked. In the following the necessary steps are being described:

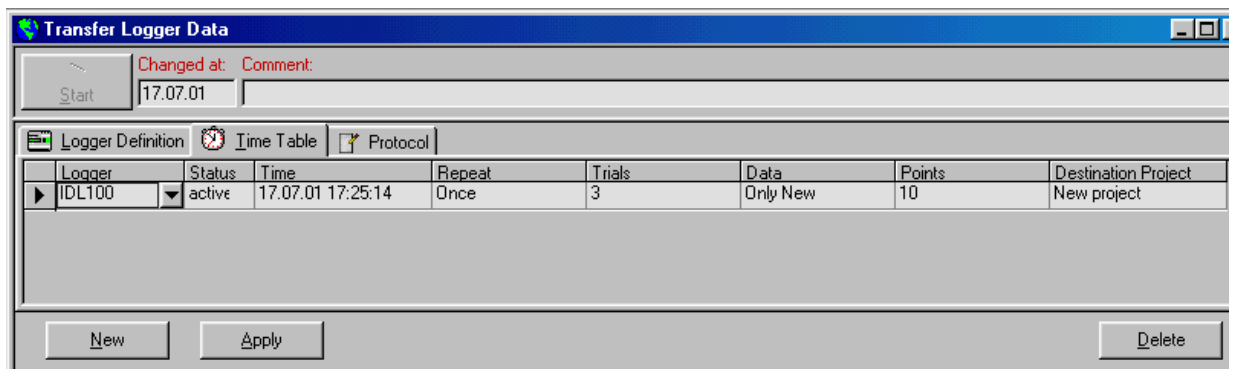


- Name:**
The data logger can be indicated with a meaningful name.
- Addr.:**
The address of the logger has to be inserted.
- COM-Typ:**
This defines whether a serial connection or a modem connection will be used.
- Baudrate:**
With a serial connection the Baud rate will be selected automatically, for modem communication 9600 and 19200 Baud are available at the moment.
- Modem Init:**
The necessary initialization string has to be defined.
- Timeout:**
This function is necessary with modem communication only.
- Dial Type:**
It can be selected between Pulse and Tone – Dial Type.

- **Phone Number:**
The necessary phone number for the modem connected to the data logger has to be defined.
- **Comment:**
Additional information can be added.

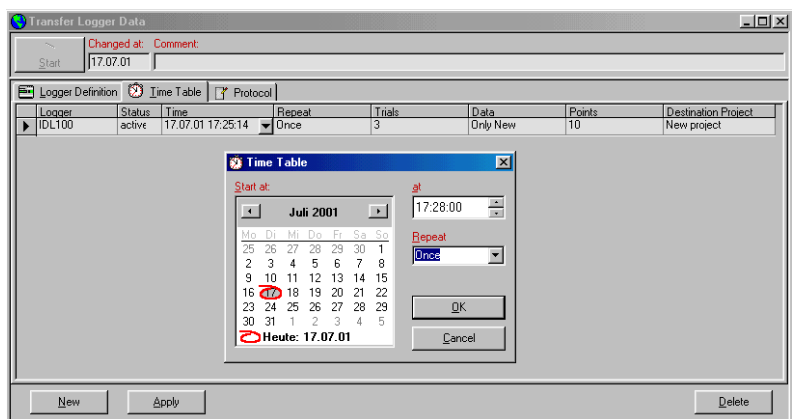
6.2. Time Table

After the logger settings data for the automation have to be added. This will be done in the field "Time Table":




When clicking the button "New" data of the data logger defined before will be selected.

- **Status:**
Here it will be defined whether the data logger should be automated or not. „Active“ and „passive“ are available.
- **Time:**
In this window date and time for the logger request are being defined. Additional it can be selected whether the request should run only once, once per hour, once per day or once per week. If these selections are not enough, one logger can be defined several times. E.g. with 3 requests per day the logger has to be defined 3 times. In this case once a day and the necessary time have to be selected.



- **Repeat:**
This will be according to the definition in field "Time Table".

- **Trials:**
This number indicates the number of trials in case the data logger does not answer at the first call.

 - **Data / Points:**
With data the following possibilities are available to read out the data logger: Either all the stored data can be transmitted or only the new ones. This reduces the transmission time. With "Last n" only the number of data sets defined in "Points" are being transmitted.
- 
- **Destination Project:**
As the automation functionality is being defined globally – several project can participate with the automation – data have to be added to the project they belong to.

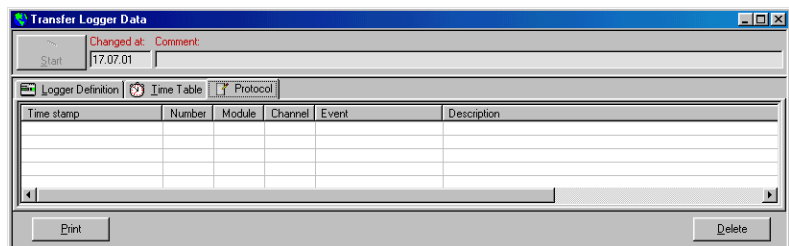
As soon as the settings are done, the button "Apply" has to be clicked and with "Start" the automation starts.

Remark:

For each data transmission a new file is being created.


6.3. Protocol

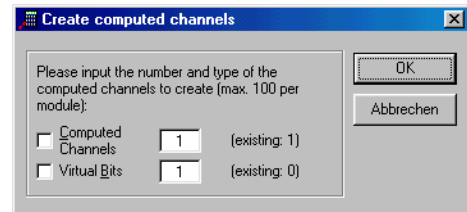
For the whole automation an own protocol will be available where all events will be written. This way data transmission can be supervised.



7. CALCULATION MODULE

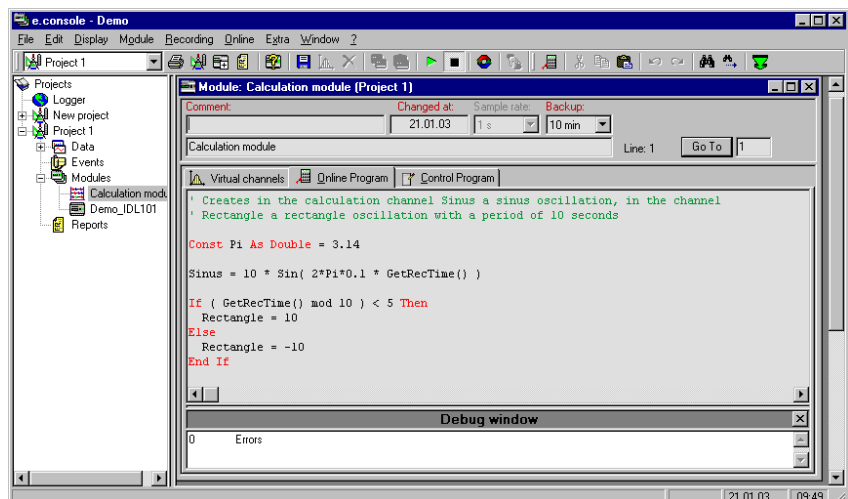
Calculation modules are being used to define virtual calculation channels for analog and digital values. One project may contain only one calculation module but this one can have up to 100 calculation channels. With the integrated BASIC editor any mathematical combinations can be realized and outputs can be controlled.

Calculation channels are added with the symbol  in the menu bar. Afterwards a window opens to define the number and kind of necessary channels:




7.1. Online Program

Online programs will be run once in each measurement cycle. First of all the inputs are being read and after the program cycle the outputs will be set. The performance of the online program is similar to that of a PLC. The online program affects the sample time of a measurement cycle which reduces the sample time. Loops and similar constructs which take longer times for calculations should be avoided if possible. Some commands such as WAIT and MESSAGE are not available with the online program. Therefore online programs will be used especially for calculations, the alarm management and similar tasks.



7.2. Control Program

Control programs are independent of the measurement cycle or the sampling rate. They work parallel to the measurements and have a low priority. These programs have to be started manually with the button  in the menu bar until the program will be stopped or finished. Therefore these programs will be used to control a measurement cycle or to monitor the measurement conditions (test bed applications).

7.3. Commands for Online- and Control Programs

Online- and control programs will be written with reduced Visual Basic-commands. The following instructions and functions are available:

7.3.1. Declarations

- Constants

Constants are being declared with "**const**".

Example:

```
const pi as double = 3.141592653
```

The const-command supports the following data types: **integer**, **long**, **double** and **boolean**.

- Variables

Variables are being defined with "**dim**".

Example:

```
dim k1 as long, k2 as long, d1 as double, b1 as boolean
```

The dim-command supports the following data types: **integer**, **long**, **double** and **boolean**.

General rules for variables:

- All local variables have to be declared explicit. This is equal to Modus Option Explicit in a Visual Basic-program.
- All channels (input, output, calculation channel) being part of the configuration of the modules can be used as variables without any additional declaration.
- Analog channels perform as variables of the type double, digital channels as variables of the type Boolean.
- No variant data types or zero-values in variables are available. Therefore the type-checking with these online programs will be stronger than those in Visual Basic-programs.

Input channels always have the current value of the channel as variable value. Output channels will be set right after the assignment of the value.

Example:

Dim x as double

x = channel_1 'the local variable x will have the current value of the channel „channel_1“

Alarm = TRUE 'The digital output channel „Alarm“ will be set to logical 1.

If channel_1 > 100 then 'The digital output „Alarm“ will be set to logical 1 if
Alarm = TRUE 'channel „channel_1“ passed the threshold-value 100.
Else
 Alarm = FALSE
End if

7.3.2. Operators

With Online- and Control programs the following Visual Basic-Operators will be supported:

Arithmetic operators:

- + Addition
- Subtraction
- * Multiplication
- / Division operation
- \ Integer division operation
- mod Module arithmetic
- ^ Exponentiation
- () Brackets for the sequence of arithmetic operations

Relational operators:

- = Equal
- <> Unequal
- > Greater than
- < Smaller than
- >= Greater or equal
- <= Smaller or equal

Logic operators:

- AND** Logic AND
- OR** Logic OR
- NOT** Logic No
- XOR** Logic exclusive OR

7.3.3. *Mathematical Functions*

With Online- and Control programs the following mathematical Visual Basic-Operators will be supported:

INT()	Changes a floating point number into an integer value (-8.4 changes to -9)
FIX()	Changes a floating point number into an integer value (-8.4 changes to -8)
ROUND()	Rounds a floating point number into an integer value
ABS()	Absolute value of a number
SGN()	Sign of a number
SIN()	Sinus of a number
COS()	Cosine of a number
TAN()	Tangent of a number
ATN()	Arc tangent of a number
EXP()	e-exponentiation of a number
LOG()	Logarithm of a number with the base e
SQR()	Square root of a number

7.3.4. *Procedures for the control program*

With the control program procedures and functions are available as follows:

GetRecTime()

This calculates the time since the start of the measurement has started as a Double-value. With such values a relative period of time in the control program can be calculated.

WAIT(time)

Waits for a period of time. Time has the unit "second" and has to be a Double type.

OUTPUT(out1, out2, outN)

Writes the current values of the outputs out1 to outN into the corresponding modules. An analog or digital output will be set at the end of a e.console-measurement cycle. The output command sets the output immediately.

Example:

```
If channel_1 > 100 then
  Alarm = TRUE
  Output( Alarm )
End if
```

MESSAGE(text)

Writes the defined text to the event-protocol.

7.3.5. Control Commands

With Online- and control programs the following Visual Basic-control command are available:

IF ... THEN ... ELSE	Single row IF-instruction
IF ... THEN	Multi line IF-instruction
...	
ELSE	
...	
END IF	
FOR ... TO ... STEP	For - loop
...	
NEXT ...	
WHILE ...	While - loop
...	
WEND	
DO WHILE (UNTIL) ...	While- resp. Until-loop with a condition at the beginning
...	
LOOP	
DO	While- resp. Until-loop with a condition at the end
...	
LOOP WHILE (UNTIL) ...	

7.3.6. Examples

```
' Online-Program  
  
' Creates in the calculation channel Sinus a sinus oscillation, in the channel  
' Rectangle a rectangle oscillation with a period of 10 seconds  
  
Const Pi As Double = 3.14  
  
Sinus = 10 * Sin( 2*Pi*0.1 * GetRecTime() )  
  
If ( GetRecTime() mod 10 ) < 5 Then  
    Rectangle = 10  
Else  
    Rectangle = -10  
End If
```

```
' Control-Program

' Opens 2 valves (digital output channels) and supervises the pressure
' (analog input channel) during the measurement

Dim time As Double
Dim ex_flag As Boolean

Valve_1 = True
Wait( 2.0 )
Valve_2 = True

ex_flag = False
time = GetRecTime()

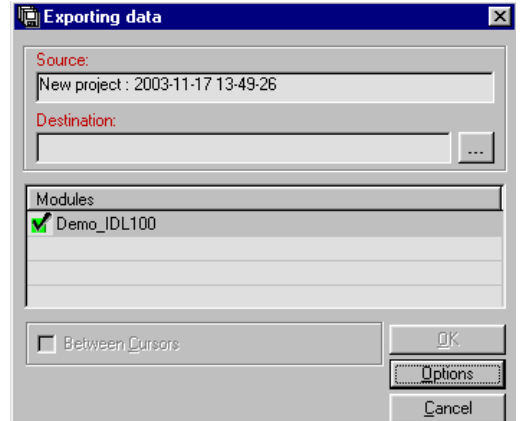
Do While GetRecTime() - time < 60 and ex_flag = False
  If Pressure > 500 Then
    Valve_1 = False
    Valve_2 = False
    Output( Valve_1, Valve_2 )
    Message( "Stop because of pressure limit" )
    ex_flag = True
  End If
Loop

Valve_2 = False
Wait( 2.0 )
Valve_1 = False

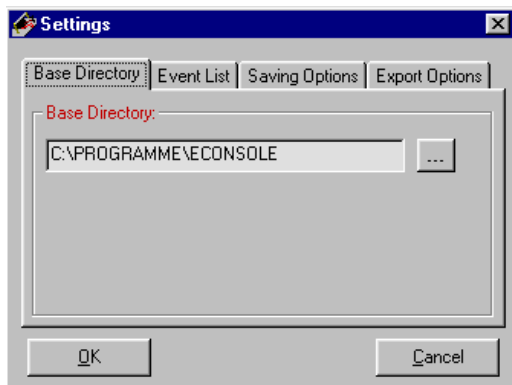
Message( "Measurement ok" )
```

8. EXPORTING DATA

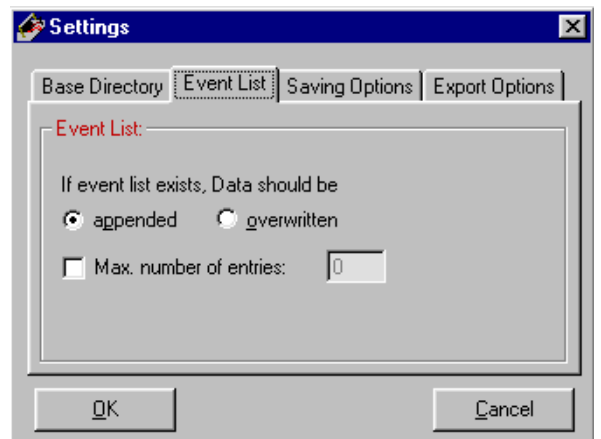
To export recorded data into a file the file has to be selected in the project tree. Via the menu "File" and "Export" the conversion to an Excel- or text-format will be started. In the following export dialog you can select the modules you want to export, define the destination file name and set type and format of the export file. This function is active only when no recording is running.



Additional settings can be defined via the button „Options“:

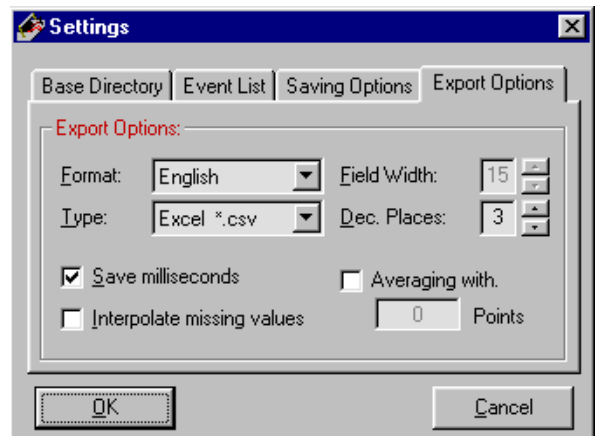
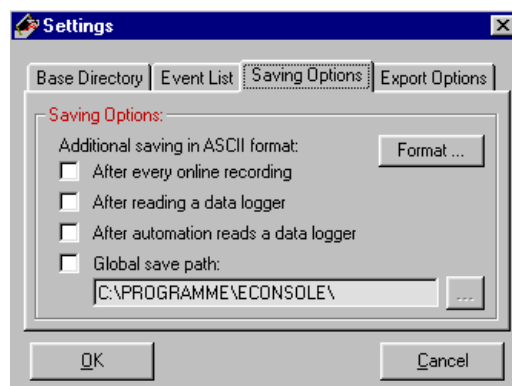


Here the Base Directory is being defined where data have to be stored.



With these settings data can be appended or over-written.

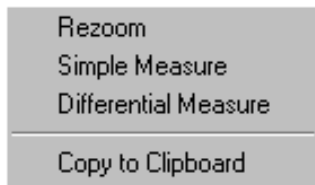
Here it is being defined in which case data have to be logged in ASCII format as well.



And these settings can be defined as well...

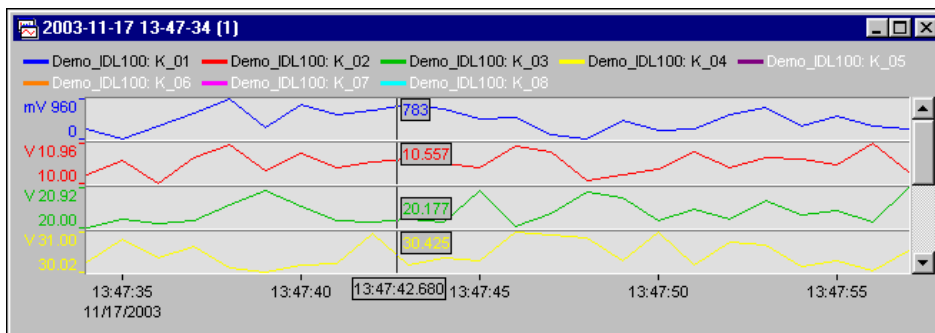
9. CURVE WINDOW

After a measurement has been started, data are being displayed in the curve windows. Settings can be realized when clicking the right mouse button in one of the curve windows.

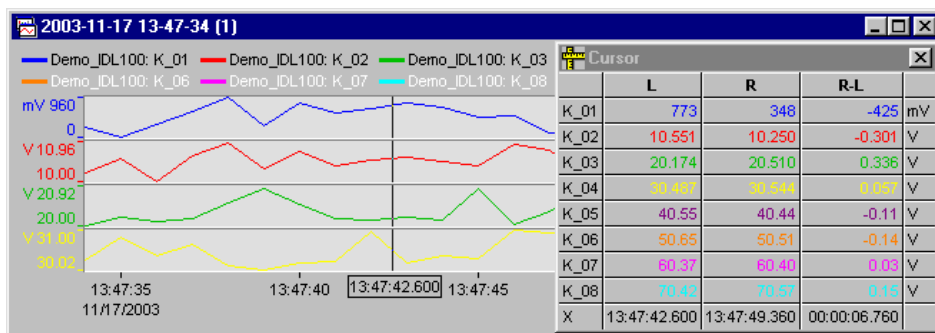


With the left mouse button parts of the curve can be selected and zoomed. Via the „Rezoom“-function you will get back to the original curve display.

With „Simple Measure“ data can be shown as digits:



With „Differential Measure“ data are displayed in chart form. With the left mouse button the left and right boundaries in the curve window can be changed:



For further information please refer to the help functionality in the menu "?"

e.console